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# Knowledge, Intent to Use, and Use of Smokeless Tobacco Among Sixth Grade Schoolchildren in Six Selected U.S. Sites

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## Synopsis .....

*Questionnaires on smokeless tobacco use were completed by 781 sixth grade students in 15 schools at six locations in the United States. The students were both American Indian-Alaska Native and non-American Indian-Alaska Native.*

*The Indian and Alaska Native schoolchildren were experimenting with and regularly using smokeless tobacco at higher rates than non-Indian schoolchildren. At Indian Health Service sites, 28.1 percent of the children reported current use of smokeless tobacco, compared with 3.3 percent of the children elsewhere. For girls reporting smokeless tobacco experimentation, the comparison was 68.9 percent at Indian Health Service sites and 8.7 percent at non-Indian sites; for boys, it was 79.1 percent from the Indian sites and 35.4 percent from the non-Indian sites.*

*For those students who had tried smokeless tobacco, more than half also reported having tried cigarettes. The majority of all sixth grade students surveyed were aware of the health risks of smokeless tobacco use in that it is an increased risk for cancer.*

*Additional research is needed to determine appropriate interventions.*

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**T**HE SURGEON GENERAL'S REPORT on the health consequences of using smokeless tobacco (ST), published in 1986, cited the potential health risks, prevalence and trends, and behavioral aspects of ST use (1). Other comprehensive summaries concerning the various aspects of ST have been published by the National Institutes of Health, the Inspector General of the Department of Health and Human Services, and the World Health Organization (2-4).

Although the use of ST may be perceived by some as a safe alternative to smoking cigarettes, prolonged use of ST has been most strongly associated with oral cancer (1,5-11) and with other health risks such as leukoplakia, gingival recession, and nicotine addiction. It also may play a contributory role in the development of coronary artery and peripheral vascular disease, hypertension, and peptic ulcers (1,12-23).

Regional and local surveys of the use of ST among schoolchildren in the United States have reported usage of 3 to 26 percent for boys and less than 3 percent for girls in grades K-12 (1,24-32).

The reported number of users among American Indian-Alaska Natives (AI-AN) in the United States is substantially higher than in the general U.S. population of the same age (33-40). Self-reported ST use among AI-AN schoolchildren for both boys and girls ranges from 9.8 to 64.2 percent (33-40). In addition, age of initiation of ST use by AI-AN children has been reported to be as young as 3 years old (35).

To ascertain the prevalence of ST use, knowledge about it, and intent to use it, a survey of sixth grade students was conducted in six selected areas in the United States. This is a report of the findings.

## Methods

Six sites throughout the United States were selected in an effort to obtain both geographic and Indian and non-Indian diversity. The sample was not intended to be representative of all Indian and non-Indian sixth grade students, nor were the six selected sites homogenous in demographics. This

Table 1. Number and percentage of students reporting use of smokeless tobacco (ST) by site, 15-school study, 1987-88

Site	Tried ST		Use ST now	
	Number	Percent	Number	Percent
State sites .....	106 of 455	23.3	15 of 455	3.3
Georgia .....	40 of 176	22.7	2 of 176	1.1
Massachusetts ..	43 of 189	22.8	5 of 189	2.7
Texas .....	23 of 90	25.6	8 of 90	8.9
Indian Health				
Service sites ....	242 of 325	74.5	91 of 325	28.1
Alaska .....	26 of 45	57.8	10 of 45	22.2
Billings .....	126 of 153	82.4	45 of 153	29.8
Navajo .....	90 of 127	70.9	36 of 127	28.1

NOTE: Difference between State and Indian Health Service sites: tried ST: chi-square=200.85;  $P < .001$ ; degrees of freedom (df)=1. Use ST now: chi-square = 98.672;  $P < .001$ ; df = 1.

*'Although the use of ST may be perceived by some as a safe alternative to smoking cigarettes, prolonged use of ST has been most strongly associated with oral cancer and with other health risks such as leukoplakia, gingival recession, and nicotine addiction.'*

purposive sample was selected on the basis of the interest of school administrators, a perceived high use of ST, and an interest in implementing a ST prevention program. Because a perceived high use of ST was one of the selection criteria for participation, the results of the survey may generally overestimate the prevalence of ST use among Indian and non-Indian sixth grade students.

Dental public health program staff members in State health departments and Indian Health Service (IHS) area offices were contacted and invited to participate. The six localities were divided into State sites and IHS sites.

The following six sites were selected:

State sites—localities in Georgia (GA), Massachusetts (MA), and Texas (TX); IHS sites—Alaska (AK), Billings (BL), and Navajo (NAV). The Billings sites included Montana and Wyoming; the Navajo sites included Arizona and New Mexico.

At each site a coordinator was assigned who was a public health professional employed by either the respective State health department or IHS Area Office and was responsible for conducting the surveys.

The survey instrument, adapted from an American Cancer Society ST questionnaire, included questions about experimentation with tobacco products. The 1-page, 19-question self-administered, anonymous questionnaire was distributed to students at each school by the respective site coordinators. The site coordinators received written and verbal instructions on conducting the survey so consistency could be maintained.

A total of 15 schools at the six sites participated in the survey, with 781 students completing the questionnaire between May 1987 and January 1988. Each of the communities where the surveys were conducted had less than 18,000 population. The response rate was 100 percent for students attending school that day. No attempt was made to survey those students who were absent. The rate of absenteeism was unknown.

All completed questionnaires from the six sites were coded for subsequent data analyses using the Michigan Interactive Data Analysis System (MIDAS). Overall, 53.9 percent of the respondents were male and 46.1 percent were female. By race, white students accounted for 40.6 percent of the respondents, 37.8 percent were AI-AN, 19.3 percent were black, and 2.4 percent were "other."

## Results

**ST use.** In response to the statement, "I have tried snuff or chewing tobacco," 23.3 percent of the students in the State sites and 74.5 percent of the students in the IHS sites responded "yes" ( $P < .001$ ). The response rates to the statement, "I use snuff or chewing tobacco now" was 3.3 percent for State sites and 28.1 percent for the IHS sites ( $P < .001$ ) (table 1). Students from IHS sites reported using more ST than students from State sites ( $P < .001$ ). While students from State sites who use ST reported average use of one can or pouch or less of ST per week, at least 25 percent of the students from IHS sites who use ST consumed two cans or pouches or more of ST per week.

At the State sites, 35.4 percent of the boys and 8.7 percent of the girls reported trying ST ( $P < .001$ ). At the IHS sites, 79.1 percent of the boys and 68.9 percent of the girls reported trying ST ( $P < .05$ ) (table 2). Current use of ST was reported by 5.7 percent of boys and 0.5 percent of girls at the State sites ( $P = .002$ ), while 27.3 percent of boys and 28.7 percent of girls from IHS sites reported current use ( $P = .79$ ) (table 2).

Table 2 displays the percentage of students by sex who responded positively to the statement, "Do

you plan to use snuff or chewing tobacco in the future?" In general, more boys than girls from both State and IHS sites indicated planned future use ( $P < .001$ ). Boys from IHS sites were twice as likely and girls from IHS sites were 10 times as likely to report future use than their State counterparts.

**Cigarette use.** In addition to ST use, the investigators surveyed cigarette use among sixth grade students. For those students who had tried ST, 61.3 percent from State sites and 59.9 percent of students from IHS sites reported having also tried smoking cigarettes. Only one student from the State sites and 12 students from the IHS sites reported current use of both ST and cigarettes.

**ST use by family and peers.** For those students who reported current ST use, 60.0 percent of students from State sites and 80.2 percent of students from IHS sites responded that someone in their family used ST (table 3). In general, a higher percentage of students who reported currently using ST also had someone in their family who uses ST compared with those students who had tried but don't currently use or with those who had never tried ST. In addition, those students who had tried ST and those who use ST also reported having more friends who use ST than those who had never used ST.

**Knowledge about ST.** Table 3 reports the percentage of students by pattern of ST use who answered "yes" to the question, "Do you think snuff and chewing tobacco are habit forming?" Overall, 80.2 percent of respondents reported ST as habit forming. A higher percentage of those students who reported using ST said that it was habit forming than those students who had tried or never used ST.

In answer to the question "Do you think that snuff and chewing tobacco can cause oral cancer?" 92.8 percent of students responded "yes" to this question (table 3). A higher percentage of students who had never tried ST indicated that ST can cause oral cancer than those who reported having tried or currently use ST.

## Discussion

In this survey, Indian schoolchildren were both experimenting with and regularly using ST at a much higher rate than non-Indian children. Additionally, Indian girls reported rates of ST use

Table 2. Number and percentage of students who reported having tried smokeless tobacco (ST), currently use ST, and plan future use of ST, by site and sex, 15-school study, 1987-88

Site	Males		Females	
	Number	Percent	Number	Percent
<i>Have tried using ST</i>				
State sites	87 of 246	35.4	18 of 207	8.7
Georgia	26 of 95	27.4	14 of 80	17.5
Massachusetts	40 of 107	37.4	3 of 82	3.7
Texas	21 of 44	47.7	1 of 45	2.2
IHS sites	136 of 172	79.1	104 of 151	68.9
Alaska	19 of 28	67.9	6 of 16	37.5
Billings	67 of 81	82.7	58 of 71	81.7
Navajo	50 of 63	79.4	40 of 64	62.5
<i>Currently use ST</i>				
State sites	14 of 245	5.7	1 of 207	0.5
Georgia	1 of 95	1.1	1 of 80	1.3
Massachusetts	5 of 106	4.7	0 of 82	0
Texas	8 of 44	18.2	0 of 45	0
IHS sites	47 of 172	27.3	43 of 150	28.7
Alaska	7 of 28	25.0	3 of 16	18.8
Billings	18 of 81	22.2	26 of 69	37.7
Navajo	22 of 63	34.9	14 of 65	21.5
<i>Plan future use of ST</i>				
State sites	19 of 239	7.9	2 of 206	1.0
Georgia	3 of 95	3.2	2 of 79	2.5
Massachusetts	7 of 102	6.9	0 of 82	0
Texas	9 of 42	21.4	0 of 45	0
IHS sites	24 of 171	14.0	16 of 148	10.8
Alaska	1 of 27	3.7	2 of 16	12.5
Billings	12 of 81	14.8	9 of 69	13.0
Navajo	11 of 63	17.5	5 of 63	7.9

IHS = Indian Health Service.

NOTE: Difference between State and Indian Health Service sites: males tried ST: chi-square=77.686;  $P < .001$ ; degrees of freedom (df)=1; females tried ST: chi-square=140.75;  $P < .001$ ; df=1. Male and female difference: State sites: chi-square=44.904;  $P < .001$ ; df=1. IHS Sites: chi-square=4.378;  $P = .036$ ; df=1.

State and IHS difference: Males use ST now: chi-square=37.793;  $P < .001$ ; degrees of freedom (df)=1; Females use ST now: chi-square=63.933;  $P < .001$ ; df=1. Male and female difference, State sites: chi-square=9.570;  $P = .002$ ; df=1; IHS sites: chi-square=0.716;  $P = .789$ ; df=1.

State and IHS difference: Male: chi-square=3.9319;  $P = .0474$ ; df=1. Female: chi-square=17.278;  $P < .001$ ; df=1.

similar to those of Indian boys, a phenomenon not documented for any other ethnic group in the United States. While this study is not representative of Indian and non-Indian sixth grade students in the United States, it is interesting that these data are consistent with data from other surveys of AI-AN children and previously documented rates by non-Indian adolescents in the United States (1,3,33-40). The use of ST by students at the State sites was predominately a male activity, while AI-AN boys and girls used ST almost equally at the IHS sites.

As reported in other surveys, fewer black adolescents use ST than white adolescents (1,38,41).

More Indian than non-Indian children report regular use of ST, and they also reported using

Table 3. Number and percentage of students reporting family use of smokeless tobacco (ST) compared with their own use, reporting belief that ST is habit forming, and reporting ST causes cancer, by site, 15-school study, 1987-88

Site	Student never used		Student tried		Student now use	
	Number	Per-cent	Number	Per-cent	Number	Per-cent
<i>Reporting family use</i>						
State sites .	93 of 347	26.8	44 of 104	42.3	9 of 15	60.0
Georgia .	68 of 136	50.0	31 of 40	77.5	2 of 2	100.0
Mass. . . .	2 of 144	9.0	5 of 42	11.9	1 of 5	20.0
Texas . . .	23 of 67	34.3	8 of 22	36.4	6 of 8	75.0
IHS sites . .	38 of 83	32.5	162 of 241	67.2	73 of 91	80.2
Alaska . .	5 of 19	26.3	10 of 26	38.5	8 of 10	80.0
Billings . .	12 of 27	44.4	83 of 125	66.4	34 of 45	75.6
Navajo . .	21 of 37	56.8	69 of 90	76.7	31 of 36	86.1
<i>Believe ST habit forming</i>						
State sites .	290 of 344	84.3	87 of 105	82.8	13 of 15	86.7
Alaska . .	101 of 133	75.9	35 of 39	89.7	2 of 2	100.0
Mass. . . .	130 of 144	90.3	33 of 43	76.7	3 of 5	60.0
Texas . . .	59 of 67	88.1	19 of 23	82.6	8 of 8	100.0
IHS sites . .	62 of 82	75.7	180 of 241	74.7	69 of 90	76.7
Alaska . .	16 of 19	84.2	19 of 26	73.1	8 of 10	80.0
Billings . .	20 of 26	76.9	110 of 126	87.3	42 of 45	93.3
Navajo . .	26 of 37	70.3	51 of 89	57.3	19 of 35	54.3
<i>Believe ST causes cancer</i>						
State sites .	322 of 346	93.1	94 of 105	89.5	11 of 15	73.3
Georgia . .	114 of 135	84.4	36 of 40	90.0	1 of 2	50.0
Mass. . . .	144 of 145	99.3	37 of 42	88.1	3 of 5	60.0
Texas . . .	64 of 66	97.0	21 of 23	91.3	7 of 8	87.5
IHS sites . .	79 of 83	95.2	223 of 240	92.9	85 of 92	92.4
Alaska . .	19 of 19	100.0	25 of 25	100.0	10 of 10	100.0
Billings . .	23 of 27	85.2	115 of 125	92.0	42 of 45	93.3
Navajo . .	37 of 37	100.0	83 of 90	92.2	33 of 37	88.9

NOTE: State and IHS difference: If never used, family use: chi-square = 7.571;  $P = .006$ ; degrees of freedom (df) = 1; If tried, family use: chi-square = 18.742;  $P < .001$ ; df = 1. If use now, family use: chi-square = 3.006;  $P = .083$ ; df = 1.  
 State and IHS difference: Habit forming, if never used: chi-square = 3.486;  $P = .062$ ; degrees of freedom (df) = 1. Habit forming, if tried: chi-square = 2.770;  $P = .098$ ; df = 1; Habit forming, if use now: chi-square = 0.752;  $P = .386$ ; df = 1.  
 State and IHS difference: can cause cancer, if never used: chi-square = 0.492;  $P = .483$ ; degrees of freedom (df) = 1. Can cause cancer, if tried: chi-square = 1.128;  $P = .288$ ; df = 1. Can cause cancer, if use now: chi-square = 4.985;  $P = .027$ ; df = 1.

more cans or pouches weekly than users at State sites. Previous studies have documented that Indian children may initiate ST use before kindergarten (35). Indian children seem to have early access to tobacco products, as well as tacit approval for ST use from their families and peers. Current users of ST at all sites had at least one friend who also used ST. At the IHS sites, several of the children reported that all of their friends used ST. Survey results indicate that more users of ST reported having more relatives or family members and more friends who also used ST than those who did not use ST. Other surveys have reported similar findings (3,30,37,42-45).

Although ST use by students at IHS sites was much more prevalent than it was by students at

State sites, the rates of experimentation and smoking of cigarettes by sixth grade students was approximately the same for both Indian and non-Indian children. These data are similar to previously published cigarette use surveys (24,46,47).

Despite the fact that some students in this survey reported using both ST and cigarettes, no conclusions can be drawn from this study because of the small number of children who reported current use of both ST and cigarettes. Some surveys have reported little overlap between ST use and cigarette smoking (31,41). Other surveys, however, have reported a correlation between ST use and cigarette smoking among Indian youth (37,42).

Even though reported ST experimentation and current ST use by AI-AN students were significantly more widespread than by students at State sites, it is unclear why this difference exists. It has not been determined whether the wider ST use by Indians is tied to their traditional culture, is a rural phenomenon, is related to the access to ST products, or is reflective of efforts by the tobacco industry in its marketing campaigns.

From these survey results, it appears that sixth grade students are aware of the health risks of ST use, that is, ST is not a safe alternative to cigarettes, and ST use is an increased risk for cancer. ST users at each site, however, were either less informed or more reluctant to identify health risks in the survey than nonusers. By contrast, in response to whether ST is habit forming, a greater percentage of users recognized the addictive aspect of ST than those nonusers who had tried or never used ST (47).

## Conclusions

Because a large percentage of AI-AN children reported using ST by the time they reached sixth grade, primary prevention programs need to be targeted at both boys and girls well before the sixth grade. Programs designed for junior and senior high school students need to address not only prevention, but include cessation.

At State sites, primary prevention programs should be targeted at boys before regular use occurs. From the results of our survey, an educational program for 12-14-year-old schoolchildren at the State sites may be appropriate, but an overall needs assessment should be conducted at each location to target programs effectively.

In general, education programs need to provide more than basic knowledge about ST. Additional components may need to address attitudes, beliefs,

behaviors, decision-making skills, and how to handle peer pressure. Because these survey results indicate a correlation between children's use of ST and family use, it would be appropriate to implement community-wide intervention programs. These programs need to include not only school-children and their families, but community leaders, policy makers, and the community at large.

Examples of community interventions include training of health care providers, educational campaigns, policies that restrict the sale of tobacco products to minors, and policies that prohibit the use of tobacco products in public areas (48). Increasing the excise tax on ST, banning the promotion and distribution of ST products on public property, and requiring enforcement of laws that restrict the sale of ST to minors should also be considered.

Research addressing cultural effects and promotional efforts is needed to determine the reasons why such a large number of AI-AN children are using ST. Additional research is also needed to determine appropriate types of interventions and to evaluate these interventions.

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